Listing of Claims:

1-49. (Cancelled)

50. (Previously presented) A method for determining a transition model between input pixel samples from which output sample values are calculated, the input pixel samples having corresponding input sample values, the method comprising:

determining from the input sample values a brightness condition;

using a first transition model that preserves a constant luminance where the brightness condition is indicative of light isolated pixels;

using a second transition model that preserves a constant darkness where the brightness condition is indicative of dark isolated pixels; and

calculating output sample values from the transition model used.

51. (Previously presented) The method of claim 50 wherein the first transition model comprises a cubic polynomial model solved using a light gradient value gr_{lt} and a dark gradient value gr_{dk} having the values:

$$gr_{lt} = \frac{1}{gm}, \text{ and}$$

$$gr_{dk} = 8\left(\frac{1}{2}\right)^{gr_{lt}} - 4 + gr_{lt},$$

where gm is a display gamma value.

52. (Previously presented) The method of claim 51 wherein the display gamma value is equal to 2.5.

53. (Previously presented) The method of claim 50 wherein the second transition model comprises a cubic polynomial model solved using a light gradient value gr_{lt} and a dark gradient value gr_{dk} having the values:

$$gr_{lt} = \frac{1}{0.4 \times gm}, \text{ and}$$

$$gr_{dk} = 8\left(\frac{1}{2}\right)^{gr_{lt}} - 4 + gr_{lt},$$

where gm is a display gamma value.

54. (Previously presented) The method of claim 53 wherein the display gamma value is equal to 2.5.

55. (Previously presented) The method of claim 50, further comprising using a third transition model that is based on a sine-model having an angular frequency of π where the brightness condition is indicative of alternating light and dark pixels.

56. (Previously presented) The method of claim 50, further comprising using a cubic transition model solved using a light gradient value $gr_{lt} = 0$ and a dark gradient value $gr_{dk} = 0.5$ where the brightness condition is indicative of alternating light and dark pixels.

57. (Previously presented) The method of claim 56 wherein determining a brightness condition from the input sample values comprises:

selecting sixteen pixel samples arranged in a four-by-four pixel array from the sample set;

identifying along a first axis pixel samples having pixels on either side having equal sample values; and

identifying along a second axis pixel samples having pixels on either side having equal sample values, the second axis perpendicular to the first axis.

58. (Previously presented) The method of claim 50 wherein the input pixel samples are arranged in a coordinate system and the method further comprises:

detecting a diagonal pixel pattern from the input sample values;

where a diagonal pixel pattern is detected, modifying the coordinate system in which the pixel samples are arranged; and

calculating a fractional position using the modified coordinate system at which the output sample values are to be calculated using the appropriate transition model.

59. (Previously presented) The method of claim 58 wherein modifying the coordinate system comprises rotating the coordinate system by 45 degrees.

60. (Previously presented) A method for calculating output sample values from input sample values corresponding to respective input pixel samples, the method comprising:

comparing sample values of a selected sample set of input sample values;

determining from the sample values of the sample set whether a first, second or third brightness condition is present, the third brightness condition having alternating light and dark pixels;

defining a first emphasis model for the sample set in response to detecting the first brightness condition;

defining a second emphasis model for the sample set in response to detecting the second brightness condition;

defining a third emphasis model for the sample set in response to detecting the third brightness condition; and

calculating output sample values using the defined emphasis model.

61. (Previously presented) The method of claim 60 wherein the first brightness condition comprises an isolated light pixel condition and the second brightness condition comprises an isolated dark pixel condition.

62. (Previously presented) The method of claim 61 wherein the first emphasis model comprises a cubic polynomial model solved using a light gradient value gr_{lt} and a dark gradient value gr_{dk} having the values:

$$gr_{lt} = \frac{1}{gm}, \text{ and}$$

$$gr_{dk} = 8\left(\frac{1}{2}\right)^{gr_{lt}} - 4 + gr_{lt},$$

where gm is a display gamma value.

63. (Previously presented) The method of claim 62 wherein the display gamma value is equal to 2.5.

64. (Previously presented) The method of claim 61 wherein the second emphasis model comprises a cubic polynomial model solved using a light gradient value gr_{lt} and a dark gradient value gr_{dk} having the values:

$$gr_{lt} = \frac{1}{0.4 \times gm}, \text{ and}$$

$$gr_{dk} = 8\left(\frac{1}{2}\right)^{gr_{lt}} - 4 + gr_{lt},$$

where gm is a display gamma value.

65. (Previously presented) The method of claim 64 wherein the display gamma value is equal to 2.5.

66. (Previously presented) The method of claim 60 wherein the third emphasis model comprises a sine-model having an angular frequency of π.

67. (Previously presented) The method of claim 60 wherein the third emphasis model comprises a cubic transition model using a light gradient value $gr_{lt} = 0$ and a dark gradient value $gr_{dk} = 0.5$.

68. (Previously presented) A method for calculating output sample values from input sample values corresponding to respective input pixel samples that are arranged in a coordinate system, the method comprising:

comparing input sample values of a selected sample set of input sample values;

determining from the input sample values of the sample set whether a first or second brightness condition is present;

where the first brightness condition is detected, defining a first emphasis model for the sample set and where the second brightness condition is detected, defining a second emphasis model for the sample set;

determining from the input sample values of the sample set whether a diagonal pixel pattern is present;

in response to determining the presence of a diagonal pixel pattern, modifying the coordinate system in which the input pixel samples are arranged and calculating a fractional position for the input pixel samples with respect to the modified coordinate system; and

calculating output sample values from the input sample values using the defined emphasis model, where the presence of a diagonal pixel pattern is determined, the input sample values based on the fractional position of the input pixel samples.

69. (Previously presented) The method of claim 68 wherein the first brightness condition comprises an isolated light pixel condition and the second brightness condition comprises an isolated dark pixel condition.

70. (Previously presented) The method of claim 69 wherein the first emphasis model comprises a cubic polynomial model solved using a light gradient value gr_{lt} and a dark gradient value gr_{dk} having the values:

$$gr_{lt} = \frac{1}{gm}, \text{ and}$$

$$gr_{dk} = 8\left(\frac{1}{2}\right)^{gr_{lt}} - 4 + gr_{lt},$$

where gm is a display gamma value.

71. (Previously presented) The method of claim 70 wherein the display gamma value is equal to 2.5.

72. (Previously presented) The method of claim 69 wherein the second emphasis model comprises a cubic polynomial model solved using a light gradient value gr_{lt} and a dark gradient value gr_{dk} having the values:

$$gr_{lt} = \frac{1}{0.4 \times gm}, \text{ and}$$

$$gr_{dk} = 8\left(\frac{1}{2}\right)^{gr_{lt}} - 4 + gr_{lt},$$

where gm is a display gamma value.

73. (Previously presented) The method of claim 72 wherein the display gamma value is equal to 2.5.

74. (Previously presented) The method of claim 68, further comprising:

determining whether a third brightness condition is present from the sample set of input sample values, the third brightness condition comprising alternating light and dark pixels; and

if the third brightness condition is present, defining a third emphasis model for the sample set.

75. (Previously presented) The method of claim 74 wherein the third emphasis model comprises a sine-model having an angular frequency of π.

76. (Previously presented) The method of claim 74 wherein the third emphasis model comprises a cubic transition model using a light gradient value $gr_{lt} = 0$ and a dark gradient value $gr_{dk} = 0.5$.

77. (Previously presented) The method of claim 74 wherein determining whether a third brightness condition is present from the sample set of input sample values comprises:

selecting sixteen pixel samples arranged in a four-by-four pixel array from the sample set;

identifying along a first axis pixel samples having pixels on either side having equal sample values; and

identifying along a second axis pixel samples having pixels on either side having equal sample values, the second axis perpendicular to the first axis.

78. (Previously presented) The method of claim 68, further comprising:

determining whether a fourth brightness condition is present from the input sample values, the fourth brightness condition comprising a transition in pixel brightness without emphasis; and

if the fourth brightness condition is present, defining a fourth emphasis model for the sample set.

79. (Previously presented) The method of claim 68 wherein modifying the coordinate system comprises rotating the coordinate system by 45 degrees.

80. (Previously presented) A resampling engine for calculating output sample values from input sample values, comprising:

input nodes at which signals representing respective input sample values for corresponding pixel samples are applied; and

a resampling circuit coupled to the input nodes and configured to compare input sample values of a selected sample set of input sample values and determine whether a first, second, or third brightness condition is present based on the input sample values of the sample set, the resampling circuit further configured to calculate output sample values from the input sample values of the sample set using a first emphasis model in response to determining the

presence of the first brightness condition, calculate output sample values from the input sample values of the sample set using a second emphasis model in response to determining the presence of the second brightness condition, and calculate output sample values from the input sample values of the sample set using a third emphasis model in response to determining the presence of the third brightness condition.

81. (Previously presented) The resampling engine of claim 80 wherein the first brightness condition comprises an isolated light pixel condition and the second brightness condition comprises an isolated dark pixel condition.

82. (Previously presented) The resampling engine of claim 81 wherein the first emphasis model comprises a cubic polynomial model solved using a light gradient value gr_{lt} and a dark gradient value gr_{dk} having the values:

$$gr_{lt} = \frac{1}{gm}, \text{ and}$$

$$gr_{dk} = 8\left(\frac{1}{2}\right)^{gr_{lt}} - 4 + gr_{lt},$$

where gm is a display gamma value.

83. (Previously presented) The resampling engine of claim 82 wherein the display gamma value is equal to 2.5.

84. (Previously presented) The resampling engine of claim 81 wherein the second emphasis model comprises a cubic polynomial model solved using a light gradient value gr_{lt} and a dark gradient value gr_{dk} having the values:

$$gr_{lt} = \frac{1}{0.4 \times gm}, \text{ and}$$

$$gr_{dk} = 8\left(\frac{1}{2}\right)^{gr_{lt}} - 4 + gr_{lt},$$

where gm is a display gamma value.

85. (Previously presented) The resampling engine of claim 84 wherein the display gamma value is equal to 2.5.

86. (Previously presented) The resampling engine of claim 80 wherein the third emphasis model comprises a sine-model having an angular frequency of π.

87. (Previously presented) The resampling engine of claim 80 wherein the third emphasis model comprises a cubic transition model using a light gradient value $gr_{lt} = 0$ and a dark gradient value $gr_{dk} = 0.5$.

88. (Previously presented) The resampling engine of claim 80 wherein the resampling circuit comprises a resampling circuit configured to determine whether a third brightness condition is present from the sample set of input sample values by:

selecting sixteen pixel samples arranged in a four-by-four pixel array from the sample set;

identifying along a first axis pixel samples having pixels on either side having equal sample values; and

identifying along a second axis pixel samples having pixels on either side having equal sample values, the second axis perpendicular to the first axis.

89. (Previously presented) The resampling engine of claim 80 wherein the resampling circuit is further configured to determine whether a fourth brightness condition is present from the input sample values, the fourth brightness condition comprising a transition in pixel brightness without emphasis, the resampling circuit further configured to calculate output sample values from the input sample values of the sample set using a fourth emphasis model in response to determining the presence of the fourth brightness condition.

90. (Previously presented) The resampling engine of claim 80 wherein the resampling circuit is further configured to detect a diagonal pixel pattern from the input sample

values, where a diagonal pixel pattern is detected, modify a coordinate system in which the pixel samples are arranged, the resampling circuit further configured to calculate a fractional position using the modified coordinate system at which the output sample values are to be calculated using the appropriate transition model.

91. (Previously presented) The resampling engine of claim 90 wherein the coordinate system is modified by the resampling circuit by rotating the coordinate system by 45 degrees.

92. (Previously presented) A resampling engine for calculating output sample values from input sample values, comprising:

input nodes at which signals representing respective input sample values for corresponding pixel samples arranged in a coordinate system are applied; and

an input sample detection circuit coupled to the input nodes and configured to compare input sample values of a selected sample set of input sample values and determine whether a first or second brightness condition is present based on the input sample values of the sample set, the input sample detection circuit further configured to detect the presence of a diagonal pixel pattern from the input sample values of the sample set; and

a resampling circuit coupled to the input nodes and the input sample detection circuit, the resampling circuit configured to calculate output sample values from the input sample values of the sample set using a first emphasis model in response to determining the presence of the first brightness condition and calculate output sample values from the input sample values of the sample set using a second emphasis model in response to determining the presence of the second brightness condition, the resampling circuit further configured to calculate output sample values from input sample values based on a fractional position of the input pixel samples in a modified coordinate system in response to detecting a diagonal pixel pattern.

93. (Previously presented) The resampling engine of claim 92 wherein the first brightness condition comprises an isolated light pixel condition and the second brightness condition comprises an isolated dark pixel condition.

94. (Previously presented) The resampling engine of claim 93 wherein the first emphasis model comprises a cubic polynomial model solved using a light gradient value gr_{lt} and a dark gradient value gr_{dk} having the values:

$$gr_{lt} = \frac{1}{gm}, \text{ and}$$

$$gr_{dk} = 8\left(\frac{1}{2}\right)^{gr_{lt}} - 4 + gr_{lt},$$

where gm is a display gamma value.

95. (Previously presented) The resampling engine of claim 94 wherein the display gamma value is equal to 2.5.

96. (Previously presented) The resampling engine of claim 93 wherein the second emphasis model comprises a cubic polynomial model solved using a light gradient value gr_{lt} and a dark gradient value gr_{dk} having the values:

$$gr_{lt} = \frac{1}{0.4 \times gm}, \text{ and}$$

$$gr_{dk} = 8\left(\frac{1}{2}\right)^{gr_{lt}} - 4 + gr_{lt},$$

where gm is a display gamma value.

97. (Previously presented) The resampling engine of claim 96 wherein the display gamma value is equal to 2.5.

98. (Previously presented) The resampling engine of claim 92 wherein the input sample detection circuit is further configured to determine whether a third brightness

condition is present from the sample set of input sample values, the third brightness condition comprising alternating light and dark pixels, and the resampling circuit is further configured to calculate output sample values from input sample values of the sample set using a third emphasis model in response to determining the presence of the third brightness condition.

99. (Previously presented) The resampling engine of claim 98 wherein the third emphasis model comprises a sine-model having an angular frequency of π.

100. (Previously presented) The resampling engine of claim 98 wherein the third emphasis model comprises a cubic transition model using a light gradient value $gr_{lt} = 0$ and a dark gradient value $gr_{dk} = 0.5$.

101. (Previously presented) The resampling engine of claim 98 wherein the resampling circuit comprises a resampling circuit configured to determine whether a third brightness condition is present from the sample set of input sample values comprises:

selecting sixteen pixel samples arranged in a four-by-four pixel array from the sample set;

identifying along a first axis pixel samples having pixels on either side having equal sample values; and

identifying along a second axis pixel samples having pixels on either side having equal sample values, the second axis perpendicular to the first axis.

102. (Previously presented) The resampling engine of claim 92 wherein the input sample detection circuit is further configured to determine whether a fourth brightness condition is present from the input sample values, the fourth brightness condition comprising a transition in pixel brightness without emphasis, and the resampling circuit is further configured to calculate output sample values from input sample values of the sample set using a fourth emphasis model in response to determining the presence of the fourth brightness condition.

103. (Previously presented) The resampling engine of claim 92 wherein the coordinate system is modified by the resampling circuit by rotating the coordinate system by 45 degrees when calculating the fractional position of the input pixel samples in response to detecting the diagonal pixel pattern.

104. (Previously presented) A graphics processing system, comprising:

a bus interface for coupling to a system bus;

a graphics processor coupled to the bus interface to process graphics data;

address and data busses coupled to the graphics processor to transfer address and graphics data to and from the graphics processor;

display logic coupled to the data bus to drive a display; and

a resampling engine for calculating output sample values from input sample values, the resampling engine comprising:

input nodes at which signals representing respective input sample values for corresponding pixel samples are applied; and

a resampling circuit coupled to the input nodes and configured to compare input sample values of a selected sample set of input sample values and determine whether a first, second, or third brightness condition is present based on the input sample values of the sample set, the resampling circuit further configured to calculate output sample values from the input sample values of the sample set using a first emphasis model in response to determining the presence of the first brightness condition, calculate output sample values from the input sample values of the sample set using a second emphasis model in response to determining the presence of the second brightness condition, and calculate output sample values from the input sample values of the sample set using a third emphasis model in response to determining the presence of the third brightness condition.

105. (Previously presented) The resampling engine of claim 104 wherein the first brightness condition comprises an isolated light pixel condition and the second brightness condition comprises an isolated dark pixel condition.

106. (Previously presented) The resampling engine of claim 105 wherein the first emphasis model comprises a cubic polynomial model solved using a light gradient value gr_{lt} and a dark gradient value gr_{dk} having the values:

$$gr_{lt} = \frac{1}{gm}, \text{ and}$$

$$gr_{dk} = 8\left(\frac{1}{2}\right)^{gr_{lt}} - 4 + gr_{lt},$$

where gm is a display gamma value.

107. (Previously presented) The resampling engine of claim 106 wherein the display gamma value is equal to 2.5.

108. (Previously presented) The resampling engine of claim 105 wherein the second emphasis model comprises a cubic polynomial model solved using a light gradient value gr_{lt} and a dark gradient value gr_{dk} having the values:

$$gr_{lt} = \frac{1}{0.4 \times gm}, \text{ and}$$

$$gr_{dk} = 8\left(\frac{1}{2}\right)^{gr_{lt}} - 4 + gr_{lt},$$

where gm is a display gamma value.

109. (Previously presented) The resampling engine of claim 108 wherein the display gamma value is equal to 2.5.

110. (Previously presented) The resampling engine of claim 104 wherein the third emphasis model comprises a sine-model having an angular frequency of π.

111. (Previously presented) The resampling engine of claim 104 wherein the third emphasis model comprises a cubic transition model using a light gradient value $gr_{lt} = 0$ and a dark gradient value $gr_{dk} = 0.5$.

112. (Previously presented) The resampling engine of claim 104 wherein the resampling circuit comprises a resampling circuit configured to determine whether a third brightness condition is present from the sample set of input sample values by:

selecting sixteen pixel samples arranged in a four-by-four pixel array from the sample set;

identifying along a first axis pixel samples having pixels on either side having equal sample values; and

identifying along a second axis pixel samples having pixels on either side having equal sample values, the second axis perpendicular to the first axis.

113. (Previously presented) The resampling engine of claim 104 wherein the resampling circuit is further configured to determine whether a fourth brightness condition is present from the input sample values, the fourth brightness condition comprising a transition in pixel brightness without emphasis, the resampling circuit further configured to calculate output sample values from the input sample values of the sample set using a fourth emphasis model in response to determining the presence of the fourth brightness condition.

114. (Previously presented) The resampling engine of claim 104 wherein the resampling circuit is further configured to detect a diagonal pixel pattern from the input sample values, where a diagonal pixel pattern is detected, modify a coordinate system in which the pixel samples are arranged, the resampling circuit further configured to calculate a fractional position using the modified coordinate system at which the output sample values are to be calculated using the appropriate transition model.

115. (Previously presented) The resampling engine of claim 114 wherein the coordinate system is modified by the resampling circuit by rotating the coordinate system by 45 degrees.

116. (Previously presented) A graphics processing system, comprising:

a bus interface for coupling to a system bus;

a graphics processor coupled to the bus interface to process graphics data;

address and data busses coupled to the graphics processor to transfer address and graphics data to and from the graphics processor;

display logic coupled to the data bus to drive a display; and

a resampling engine for calculating output sample values from input sample values, comprising:

input nodes at which signals representing respective input sample values for corresponding pixel samples arranged in a coordinate system are applied; and

an input sample detection circuit coupled to the input nodes and configured to compare input sample values of a selected sample set of input sample values and determine whether a first or second brightness condition is present based on the input sample values of the sample set, the input sample detection circuit further configured to detect the presence of a diagonal pixel pattern from the input sample values of the sample set; and

a resampling circuit coupled to the input nodes and the input sample detection circuit, the resampling circuit configured to calculate output sample values from the input sample values of the sample set using a first emphasis model in response to determining the presence of the first brightness condition and calculate output sample values from the input sample values of the sample set using a second emphasis model in response to determining the presence of the second brightness condition, the resampling circuit further configured to calculate output sample values from input sample values based on a fractional position of the input pixel samples in a modified coordinate system in response to detecting a diagonal pixel pattern.

117. (Previously presented) The resampling engine of claim 116 wherein the first brightness condition comprises an isolated light pixel condition and the second brightness condition comprises an isolated dark pixel condition.

118. (Previously presented) The resampling engine of claim 117 wherein the first emphasis model comprises a cubic polynomial model solved using a light gradient value gr_{lt} and a dark gradient value gr_{dk} having the values:

$$gr_{lt} = \frac{1}{gm}, \text{ and}$$

$$gr_{dk} = 8\left(\frac{1}{2}\right)^{gr_{lt}} - 4 + gr_{lt},$$

where gm is a display gamma value.

119. (Previously presented) The resampling engine of claim 118 wherein the display gamma value is equal to 2.5.

120. (Previously presented) The resampling engine of claim 117 wherein the second emphasis model comprises a cubic polynomial model solved using a light gradient value gr_{lt} and a dark gradient value gr_{dk} having the values:

$$gr_{lt} = \frac{1}{0.4 \times gm}, \text{ and}$$

$$gr_{dk} = 8\left(\frac{1}{2}\right)^{gr_{lt}} - 4 + gr_{lt},$$

where gm is a display gamma value.

121. (Previously presented) The resampling engine of claim 120 wherein the display gamma value is equal to 2.5.

122. (Previously presented) The resampling engine of claim 116 wherein the input sample detection circuit is further configured to determine whether a third brightness condition is present from the sample set of input sample values, the third brightness condition comprising alternating light and dark pixels, and the resampling circuit is further configured to calculate output sample values from input sample values of the sample set using a third emphasis model in response to determining the presence of the third brightness condition.

123. (Previously presented) The resampling engine of claim 122 wherein the third emphasis model comprises a sine-model having an angular frequency of π.

124. (Previously presented) The resampling engine of claim 122 wherein the third emphasis model comprises a cubic transition model using a light gradient value $gr_{lt} = 0$ and a dark gradient value $gr_{dk} = 0.5$.

125. (Previously presented) The resampling engine of claim 122 wherein the resampling circuit comprises a resampling circuit configured to determine whether a third brightness condition is present from the sample set of input sample values comprises:

selecting sixteen pixel samples arranged in a four-by-four pixel array from the sample set;

identifying along a first axis pixel samples having pixels on either side having equal sample values; and

identifying along a second axis pixel samples having pixels on either side having equal sample values, the second axis perpendicular to the first axis.

126. (Previously presented) The resampling engine of claim 116 wherein the input sample detection circuit is further configured to determine whether a fourth brightness condition is present from the input sample values, the fourth brightness condition comprising a transition in pixel brightness without emphasis, and the resampling circuit is further configured to calculate output sample values from input sample values of the sample set using a fourth emphasis model in response to determining the presence of the fourth brightness condition.

127. (Previously presented) The resampling engine of claim 126 wherein the coordinate system is modified by the resampling circuit by rotating the coordinate system by 45 degrees when calculating the fractional position of the input pixel samples in response to detecting the diagonal pixel pattern.